

EDITORIAL ARTICLES.

THE SURGERY OF THE LIVER.

As long ago as 1830 Bégín,¹ of Val-de-Grace, cut through the abdominal wall and the parietal peritoneum—not down to it, as is usually stated—for the exposure of a hydatid cyst, and, stuffing the wound with charpie until adhesions had taken place between the lips of the abdominal wound and the liver, opened and evacuated the cyst. Five years previously, Récamier² had conceived this operation, but had not put it into execution, preferring instead the application of caustics on the external surface of the abdominal wall for the purpose of inducing adhesive inflammation, and opening the abscess or cyst cavity at the site of the adhesions. The terror with which the peritoneum was regarded by surgeons of the intervening epoch prevented the acceptance of the operation of Bégín, and, up to the time of Dieulafoy's invention of the aspirator, abscess of the liver was treated, when treated at all, by incision, after adhesion with the abdominal parietes had been induced naturally or artificially. To the average practitioner of surgery the liver was a sealed book. The remarks of Budd³ well express the sentiment of the times with regard to operative intervention in abscess of the liver, the first affection of that organ to be attacked by the surgeon: "From what I have seen and read of hepatic abscesses, it seems to me that the proportion of recoveries has been just as great or even greater when the abscess has opened into the lung or the bowel, as when it has made its way through the side, and I can only explain the circumstance by the fact that, when an abscess has pointed at the side, it has seldom been allowed to open of itself. When the abscess is large and has existed long, its walls are thick and

¹ *Jour. hebdom.*, t. i., 1830.

² *Revue méd. et étrang.*, t. vi, 1825.

³ On diseases of the liver. By George Budd. Lond., 1852.

unyielding, and it has in consequence still less disposition to close up. When an abscess of this kind opens of itself, either outwardly or into the intestine or lung, matter continues to be discharged and the patient generally dies, worn out by the protracted suppuration. When the abscess is opened by the knife, the same thing, of course, happens and *the patient dies the earlier for our meddling.*" [Italics ours, Ed.]. As late as 1878, Agnew¹ particularly cautions against premature opening of hepatic abscesses, considering it important that the work of inflammatory consolidation between the gland and the abdominal wall be thoroughly accomplished; when pointing takes place, accompanied by fluctuation, and the skin over the swelling assumes a purple discoloration, the abscess should be opened by making a puncture with the ordinary sharp-pointed bistoury. It is difficult to understand how so learned a surgeon could have omitted in this connection any reference to the aspirator, presented to the profession by Dieulafoy eight years before,² and by the same surgeon studied in its application to abscess of the liver³ six years before. Aspiration by its utility as a means of diagnosis and treatment, marked a new era in the treatment of abscesses of the liver and, in the hands of its inventor, of Condon, Maclean, Hammond and many others it has produced remarkable results. Ball⁴ aspirated 51½ ounces of pus from an abscess of the liver in two operations, obtaining a complete cure. Nevertheless, while efficient in case of small abscesses, it has not proven the *ne plus ultra* for larger ones.

With the introduction of antiseptic methods and the consequent expansion of abdominal surgery, attention was again attracted to the treatment of hepatic abscesses by free incision and drainage. In the beginning, surgeons resorted again to the method by preliminary adhesion secured by caustic, puncture or incision, after which the cavity was opened antiseptically and drained; but later, with the courage

¹Principles and Practice of Surgery. By D. Hayes Agnew, vol. 1, p. 362, Phila., 1878.

²*De l'aspiration pneumatique sous-cutanee. Par Georges Dieulafoy, Paris, 1870.*

³*Du diagnostique et du traitement des kystes hydatiques et des abcès du foie par aspiration. Par Georges Dieulafoy, Paris, 1872.*

⁴*Lancet*, Dec. 1, 1877.

born of experience, the operator came to open the abdominal cavity boldly, suture the lips of the parietal wound to the liver and evacuate the pus. Proper drainage and antiseptic dressings completed a treatment, which has produced almost uniform success. A case presented at the last meeting of the British Medical Association by Thornton¹ is unique in that it was attacked through the pleura. A man, æt. 43, had been affected fifteen months previously with an abscess of the left lobe of the liver, which had been treated successfully by aspiration. After two months, the trouble returned and the right side of the liver was aspirated between the ribs, removing a quantity of sweet pus, but without relieving the symptoms. Dr. Thornton being consulted, determined to use the mark of the needle as a guide to free incision and drainage of the cavity. He first removed a lozenge-shaped piece of skin, a method which he strongly recommends in cases in which it is advisable to keep an opening for drainage. Careful dissection soon opened up a perfectly healthy pleura, with no sign of adhesions. Knowing that the abscess was deeply situated and that it could be reached by this way, although an abscess should not be opened into a perfectly healthy pleura, he determined to attempt to sew the two layers of the pleura together and thus obtain a funnel through which he could proceed, without fear of letting pus escape into the pleural cavity. He first raised the parietal pleura all around so as to get a little free edge, and then made a very careful longitudinal incision through the visceral pleura, raised it all around with a blunt director and then, with a fine curved needle, united the two layers of the pleura firmly together with a continuous silk suture. Having thus got a channel, he dissected down to the liver substance and plunged in one of Fayrer's grooved hepatic trocars, reaching the pus through a considerable depth of liver tissue; and, using the groove in the trocar as a director for a probe-pointed bistoury, the incision was enlarged and a drainage tube inserted. With antiseptic care a rapid cure ensued.

Briefly then, the surgical treatment of hepatic abscess may be said to be: (1). Aspiration first in all cases except those which have pro-

¹The surgical treatment of diseases of the liver. By J. Knowsley Thornton. *Brit. Med. Jour.*, vol. ii, 1886, p. 901.

gressed so far as to point externally, in which free incision and drainage should be the immediate resort. (2). In case of a tendency to refill, in default of an amelioration of the symptoms or in those cases about to open externally spontaneously, free incision, suturing the liver to the abdominal wall, if no adhesions exist, complete evacuation of the pus focus, drainage and antiseptic dressing. (3). In case of deep intra-hepatic deposits, and those which cannot be reached without wounding large vessels, the treatment is as yet unsettled. Aspiration and the injection of an ethereal solution of iodoform, according to the method of Verneuil, may be of advantage.

HYDATID CYSTS.—In the treatment of hydatid cysts of the liver, medical methods are noteworthy only for their inefficacy. The procedures of simple puncture, the acupuncture of Trousseau and electrolysis have not given results such as to entitle them to be received into the category of recognized methods. The procedures of Bégin and Récamier have already been noticed, but it may be remarked that the method of the former was practically that of Volkmann, to be noted presently.

Boinet treated hydatid cysts by puncturing them with a large trocar, for the canula of which was substituted after eight or ten days, a rubber tube for drainage. This method required a long time for obtaining final results, the evacuation of the contents of the cyst being slow. Blachez,¹ in 1868, observing this objection, devised the plan of treating the cysts by multiple openings with caustic, his idea being that they would facilitate the introduction of drains, the passage of injections and the outflow of cystic fluid, and that they could be easily connected by an incision after adhesive inflammation had set in.

This would seem to have been the forerunner of Simon's method of introducing two trocars into the more prominent part of the tumor, about an inch and a half apart, and allowing a part of the fluid to flow out. The trocars were then kept in place by an antiseptic dressing until the fluid which flowed out was found to be purulent, indicating the production of adhesive inflammation, upon which the intervening tissue was divided and the cavity opened and divided. This

¹*Gaz. hebdom.*, 1868.

method has been modified in some respects, notably by Hirschberg, who made a series of punctures along the line of the final incision, to more surely obtain adhesion, and by Küster, who divided the intermediate tissue by the elastic ligature.

Morris¹ advocates the treatment by puncture and evacuation of the cyst by a fine trocar or an aspirating needle, after the method of Dieulafoy,² with two exceptions: (1). When the cyst contents are very largely composed of daughter cysts instead of fluid (2) and when suppuration has already set in. In these cases free incision should certainly be employed. He presents a table of 17 cases of hydatids of the liver, treated by this method in the Middlesex hospital between 1870 and 1882. Of these, 4 were afterward freely incised and drained. In one case, free incision was performed at once. Of the 17 cases, 4 terminated fatally, 3 of these being cases in which free incision followed the tapping.

All these methods are subject to the objections of long duration and the danger that the contents of the sac may enter into the peritoneal cavity and excite hydatid disease there.

The operation of Volkmann would seem to obviate the latter objection. It is performed in two stages as follows: (1). An incision is made about three inches in length, parallel to the false ribs and involving all the soft parts down to the peritoneum. When hæmostasis has been obtained, the peritoneal layer is opened in the entire length of the incision and the wound dressed with iodoform gauze. (2). After five or six days, when adhesion has occurred between the peritoneal layer of the wound and that of the tumor, the tumor is incised, the contents evacuated, the cavity cleaned with an antiseptic solution, drainage provided and the wound dressed antiseptically. This operation has been attended with a success remarkable as compared with that of the old methods by caustic and canula, Lihotzky having collected 17 cases, all of which were successful.

The method of Lindemann, devised independently and about the

¹Injuries and diseases of the abdomen. By Henry Morris. *Internat. Encyclop. of Surgery*, vol. v, p. 1,046, *et. seq.*

²*Loc. cit.*

same time by Sanger, is similar to that of Volkmann, with the exception that it is completed in a single operation, thus obviating the objectionable feature of that method. Lindemann cuts down to the cyst as in the method of Volkmann, including the parietal peritoneum, which is sutured to the skin with catgut. From one angle of the wound to the other, through the cyst wall and parallel to the long axis of the wound, he passes two catgut sutures, to draw the cyst into close apposition with the lips of the cutaneous wound, and incise the tumor between them; when the contents of the cyst are evacuated, the operation is completed by suturing the protruding edges of the cyst-wound to the lips of the external wound and applying suitable dressings. This method efficiently prevents the entrance of any of the contents of the cyst into the abdominal cavity and obtains a cure as quickly as it is possible.

Landau cuts down to the liver with due antiseptic precautions, but, instead of passing sutures parallel to the axis of the wound, passes perpendicular to it at each angle a strong thread, including the abdominal and cyst walls in the suture. Then a quantity of the fluid is drawn off by the aspirator, after which the relaxed walls of the cyst can be drawn out through the wound and opened entirely external to the abdominal cavity, and the contents removed without danger to the peritoneal cavity. This done, as much of the cyst wall as possible is excised and the lips of the wound sutured to the edges of the abdominal incision.

The history of these operations shows a marked freedom from fatal results. Lihotzky reports 17 operations by Volkmann's method without a death. The accompanying tables, including all the cases tabulated by Poulet,¹ with a number of others, comprised 64 operations, of which 12 were done by the method in two stages, with no death attributable to the operation, and 53 by the method in one sitting, with but 8 deaths, of which but 4 can be attributed to the operation, giving the operation a mortality of but 7 per cent.

¹*Des nouvelles methodes de traitement des kystes hydatiques du foie. Par le Dr Poulet (Val-de-Grace). Revue de chirurgie, June, 1886.*

TABLE I.—OPERATIONS IN TWO STAGES

No.	Date.	Operator.	Sex and Age.	Locat'n	Operative Details and Complications.	Result.	Authority.
1		Trendelenburg.	Not specified.	Not specified.		Cure.	Mecklenb. Samml., '85, No. 101.
2	July 18, 1878.	Trendelenburg.	"	"		Prolonged fistulous period; death '79.	Loc. cit., 1878, No. 102.
3		Trendelenburg.	"	"		Cure.	Loc. cit., No. 104.
4		Rudolphi.	"	"		Cure.	Loc. cit., No. 108.
5		Madelung.	"	"		Cure.	Loc. cit., No. 143.
6		Heusner.	"	"	Complicated case.	Cure.	Deutsch. Med. Woch., No. 49, '84.
7		Schmid.	"	"		Cure, but death from pleurisy on the 14th day.	Cent. f. Chir., Jun-27, 1885.
8		Lihotsky.	"	"		Cure.	Zeitschr. f. Chir., Bd. xxii., '8
9		Lihotsky.	"	"		Cure.	Loc. cit.
10		Lihotsky.	"	"		Cure.	Loc. cit.
11		Maydl.	"	"		Cure.	Loc. cit.
12		Suslin.	Female, 22.	"	Complicated with perforation of the diaphragm and pleura.	Rapid cure.	Revue des Sc. Med., 1886, t. xxvii, p. 674.

TABLE II.—OPERATIONS IN ONE SITTING.

No.	Date.	Operator.	Sex and Age.	Local'n	Operative Details and Complications.	Result.	Authority.
1	July 8, '71	Lindemann	Female æt. 36			Cure Sept. 23	Langenbeck's Arch. Bd. xxxiii
2	June 19, '72	"	Male æt. 20			Cure Aug. 20	Loc. cit.
3	Aug. 19, '73	"	Female æt. 24	Left lobe	Empyema; hepatic abscess	Death from pyæmia Nov. 9	Loc. cit.
4	Sept. 9, '73	"	Female æt. 30			Cure Dec. 17	Loc. cit.
5	Sept. 17, '79	"	Male æt. 8		Pleurisy	Death Oct. 6	Loc. cit.
6	Mar. 1, '80	"	Female æt. 28			Cure June 19	Loc. cit.
7	Dec. 16, '81	"	Female æt. 30			Cure	Loc. cit.
8	Mar. 19, '85	"	Female æt. 37			Cure May 19	Loc. cit.
9	'85	"				Cure	
10	'85	"				Cure	
11	'85	"				Cure	
12	'76	Sänger	Male			Cure in 3 wks	Berlin Klin. Woch., '77
13	Sept. 14, '79	Landau	Female æt. 12			Cure Nov. 17	Loc. cit. '80
14	Oct. 15, '82	Leisrink	Male æt. 36		Two isolated cysts, treated in two operations	Cure Jan. '83	
15	Nov. 24, '82	"	Male æt. 36				
16	Mar. 31, '81	Asmuth	Female æt. 35			Cure	Langenbeck's Arch. Bd. xxxiii.

TABLE II CONTINUED.

No.	Date.	Operator.	Sex and Age.	Locat'n	Operative Details and Complications.	Result.	Authority.
17	June 13, '83	Vogt-Wisniewski	Female æt. 25			Cure	Loc. cit.
18	Nov. 22, '82	Madelung	Male æt. 25		Adherent to the intestine	Death 2d day from collapse	Loc. cit.
19	Nov. 9, '83	Grunberg	Male æt. 32			Cure	Loc. cit.
20	'80	Thornton	Female æt. 22		Very large cyst.	Death in 13 hours from septicæmia.	Cent. f. Chir., '83.
21	'83	"	Female æt. 41			Cure in 4 w'ks.	Loc. cit.
22		Küster				Cure.	Congress of German surgeons, '82
23		Oliver				Cure.	Lancet, '83
24	'84	Puky				Cure.	Langenbeck's Arch., Bd. xxxi
25	'85	Heusner			Resection of ribs.	Cure.	Deutsch. Med. Woch.
26	'85	Schmid				Doubtful.	Cent. f. Chir. '85
27	'85	Kusmin	Female	Left lobe	Cyst had perforated the inferior vena cava and a prolongation passed into the vena cava and right auricle.	Death due to sudden occlusion by the prolongation of the cyst.	Lancet, '85, ii, p. 78
28	'85	Schede			Resection of ribs.	Cure.	Meckl. Samml
29	'85	Madelung			" "	Favorable progress at first but death after 6 weeks of hæmorrhage from a duodenal ulcer.	Meckl. Samml No. 130

TABLE II CONTINUED.

No.	Date.	Operator.	Sex and Age.	Location	Operative Details and Complications.	Result.	Authority.
30	'85	Marung				Cure.	Meckl. Samml No. 130
31	'83	Batchelor	Female æet. 34	Under surface	Patient 3 months advanced in pregnancy; adhesions to omentum.	Cure in two weeks without affecting pregnancy.	Austral. Med. Jour., '83
32	'85	Terrier	Female æet. 19	Under surface	Median incision.	Cure in four months.	Bull de la Soc. de Chir., '85
33	'	Monod	Female			Cure with persisting fistula.	Loc. cit.
34	'85	Richelot	Male		Incision in the linea alba.	Cure; fistula; death after a second operation.	Loc. cit.
35	'85	Lucas-Chanponnière		Anterior border		Cure	Loc. cit.
36	'85	Terrier	Female	Under surface.		Cure in two months.	Loc. cit. '86
37	'85	Poulet	Male æet. 32	Anterior face	Incision parallel to false ribs.	Cure in fifty days with weakening of abdominal walls.	Revue de Chir. '86
38	'85	Weir.	Male æet. 26	Right lobe	Separate tumor of mesentery.	Death on the tenth day from renal & septic complications.	N Y. Surg. Soc. Feb. 24 '85
39	'86	Segond Reclus	Male	Intra hepatic	Incision parallel to false ribs.	Cure slow; persistent fistula.	Gaz. Hebdom., '86.
40	'86	Reclus and Fereol	Male		Incision parallel to false ribs; suppurating cyst.	Cure in 66 days; fistula.	Soc. de Chir. '86.
41	'86	Cripps			Two large cysts extirpated.	Cure.	Lancet, I '86, p. 879.

TABLE II CONTINUED.

No.	Date.	Operator	Sex and Age.	Location.	Operative Details and Complications.	Result.	Authority.
42	July 16, '80	Tait	—ret. 57			Cure	Brit. Med. Jour., ii, '86, p. 905.
43	Feb. 9, '81	"	—ret. 28			Cure	Loc. cit.
44	Feb. 15,	"	—ret. 20		These operations all consisted simply in opening the abdomen, emptying the cyst, opening it, cleaning it out, and stitching the wound in the liver to that in the parietes, so as to form a fistula. A drainage tube was kept in until union between the two peritoneal surfaces had taken place, or the diminished quantity of the discharge indicated the possibility of removing the tube.	Cure	Loc. cit.
45	May 20, '81	"	—ret. 7			Cure	Loc. cit.
46	Aug. 15, '81	"	—ret. 63			Cure	Loc. cit.
47	Nov. 4, '81	"	—ret. 25			Cure	Loc. cit.
48	Oct. 7, '85	"	—ret. 22			Cure	Loc. cit.
49	May 7, '82	"	—ret. 38			Cure	Loc. cit.
50	Dec. 5, '85	"	—ret. 18			Cure	Loc. cit.
51	'82	Thornton	Female, ret. 41	A single cyst so large as to displace the gall bladder into the right iliac fossa hydatids filling the abdomen and protruding under Fournier's ligament into Scarpa's triangle.	Cyst evacuated and cavity sponged out with pure tincture of iodine.	Cure	Brit. Med. Jour., ii, '86, p. 902.
52	'83	"	Female		Opened and drained. Recurrence and spontaneous evacuation.	Cure	Loc. cit.
53	Feb. 14, '86	Marsh	Male, ret 11-2	Had been aspirated twice. In course of the case hydatid swellings detected in different parts of the body were aspirated.	Incision in left hypochondrium; 36 oz. evacuated.	Cure; fistula reopened but the discharge was diminishing.	Brit. Med. Jour., ii, '86, p. 905.

The following case, operated upon by Poulet, is a good illustration of the best modern practice in these operations: In an adult male of robust constitution, with due antiseptic precautions, an incision 10 cm. long was made parallel to the border of the false ribs, over the most prominent part of the tumor. After the muscles and aponeuroses had been divided and hæmorrhage controlled by hæmostatic forceps, the parietal peritoneum was divided and the edges sutured by catgut to the lips of the external wound. Three-fourths of a litre of limpid fluid was then aspirated from the cyst, and as its distention diminished, the wall was drawn out with forceps and a suture passed through the abdominal and the cyst walls at each angle of the wound. The cyst was then opened, evacuated, a portion of its anterior wall excised; the edges of the cyst-wound sutured to the external opening, two drainage tubes inserted into the cavity, which had a capacity of two litres, and antiseptic dressings applied. The sac came away twelve days later and the case passed on to a good recovery completed in fifty days, with some weakness of the abdominal wall.

Poulet considers the indications for active treatment to be subject to the nature of the fluid, the size of the cyst, its seat and its connections with the neighboring viscera. (1) The treatment appropriate for a suppurating cyst is that suitable for an abscess of the liver, incision and evacuation. (2) While the existence of a large cyst, filling up the abdomen and crowding up the diaphragm and neighboring viscera would undoubtedly be an indication for operation, the small size of a cyst would not necessarily constitute a contraindication. (3) Of greater importance is the situation of the cyst with regard to the liver, and the cases may be grouped in four classes (*a*) Cysts of the inferior face of the liver, more or less pedunculated and extending usually toward the lower part of the abdomen; (*b*) Intra-hepatic cysts adjacent to the anterior face and the left lobe; (*c*) Central intra-hepatic cysts; (*d*) Postero-superior cysts; (*e*) Complicated cysts—communicating with the pleura or the bronchi.

The advantage of laparotomy in the first two classes is evident. The question of propriety of operation in deep intra-hepatic cysts, which, while augmenting the size of the liver, do not project at any point, is

more doubtful; although simple aseptic wounds of the liver have not the traditional gravity attributed to them, and the indurated tissue about a cyst is less subject to hæmorrhage than the normal tissue, the conditions are such as to demand exceptional skill and unceasing caution, and a number of cases is required before the question of operation can be settled. Cysts of the upper and posterior portion of the liver had been considered inaccessible, but Israel and Genzmer have reached such tumors by resection of the ribs at the back of the thorax, and the operation must be considered as justifiable, although only with the greatest precautions and in the hands of the surgeon of great skill and long experience. Complicated cysts open up special indications with each case; if a hepatic cyst continues to increase after a rupture and forms a prominence between the ribs and the umbilicus, laparotomy, evacuation and drainage would unquestionably be indicated.

SIMPLE CYSTS.—The liver, in common with other abdominal viscera, is subject to the development of simple cysts. These are subject to the same operative methods as hydatid cysts or hepatic abscess. When presenting no inconvenience from rapid growth or large size, they may be left to themselves. Tait tabulates two successful cases of hepatotomy for the relief of such formations.¹ Morris² notes a case of multiple dermoid cyst attached to the surface of the liver, observed by Hulke.

WOUNDS OF THE LIVER.—In the discussion on the surgical treatment of diseases of the liver at the meeting of the British Medical Association already referred to, Thornton² related a case where, in connection with an ovariectomy, he made a deep tear of the liver, from which a very alarming hæmorrhage proceeded; this stopped immediately upon the edges of the tear being brought together and maintained in position by a pair of broad-bladed polypus forceps. The patient eventually dying and affording an opportunity of examining the liver, it was found that no oozing had taken place after the abdomen was closed and that the rent was entirely closed by recently¹ deposited

¹ On the surgical treatment of diseases of the liver. By Lawson Tait. *Brit. Med. Jour.* vol. ii. 1886. p. 907

² *Loc. cit.*

lymph; from which he concluded that, if a deep rent in the substance of the liver would heal in a patient dying during its healing, we had not much to fear from wounding the liver substance, and might deal with it on ordinary surgical principles, so long as we avoid the large vessels. In the practice of abdominal surgery, it has not infrequently happened that the surgeon has accidentally wounded the liver, and these wounds have usually healed satisfactorily under suitable treatment. Otis¹ collected twenty-six authentic cases of recovery from punctured and incised wounds of the liver, all of which occurred before the day of antiseptic surgery, and without operative assistance applied directly to the gland. According to Ewart,² there is a preparation in the Medical Hospital of Calcutta of a piece of liver of the size of the hand, which had protruded through a gunshot wound and been sliced off, the patient ultimately recovering. A natural deduction from these facts would be that moderate incised wounds could easily be controlled by direct surgical action, where possible drawing the lips of the wound carefully together.

The latter surgeon also knew a gentleman, who had a bullet wound right through his liver, losing a large quantity of blood, but he recovered and was in good health. In this connection, Smartt's case of bullet-wound of the right lobe of the liver teaches an important lesson. A pistol ball, weighing eighty grains, entered the liver obliquely and was buried in the hepatic substance about a half an inch below the surface, its position being shown by a little elevation. Incision, removal, suture and antiseptic dressing were rewarded by the patient's emerging from a state of utter collapse and by his ultimate perfect recovery. In addition to the cases occurring during the War of the Rebellion, Otis³ has collected sixty instances of recovery from gunshot wounds of the liver; of fifty-nine cases, occurring during the war, of uncomplicated shot-wounds of the liver—the injury not being associated with fractures of the ribs or of the vertebral apophyses or with lesion of the lung, diaphragm, stomach, hepatic ducts or gall bladder, the spleen, pancreas, kidneys or blood vessels—twenty-five recovered; thirty-seven

¹ Med. and Surg. History of the War of the Rebellion. Part II, Surgical volume. By George A. Otis. Page 130.

² Remarks by J. Ewart (Brighton). *Brit. Med. Jour.*, vol. ii, 1886, p. 909.

³ *Loc. cit.* p., 140.

patients recovered from shot-wounds believed to involve the liver, complicated by various other grave injuries either of the abdomen or of other regions. It should be recalled that these results were obtained without antiseptics and in the great majority, if not all, of the cases without operative intervention, merely through the efforts of nature. It can hardly be doubted that greater boldness and readiness to resort to exploratory laparotomy in case of wounds of the abdomen, with prompt surgical action in case of wounds of the liver—and other solid viscera as well—will be recompensed by a greatly diminished mortality in these cases.

RUPTURE OF THE LIVER.—This lesion is quite generally accompanied by other injuries so severe as to render any surgical interference useless. When not fatal by its complications, the depth and extent of the injury and the large vessels torn are likely to impose a mortal termination. However, the facility with which hæmorrhage from a wound of the liver can be stopped by bringing the faces of the wound together, and the readiness with which such wounds heal, even when comparatively extensive, would seem to justify exploratory laparotomy in cases where the symptoms appear to indicate such an injury, and antiseptic suture of the wound.

HEPATIC PHLEBOTOMY.—Reflecting upon the futility of leeching and cupping of the abdominal parietes in engorgement of the liver, because of the absence of immediate anatomical connection between the circulation of the two parts, and upon the impunity with which, in certain experiments upon animals, small quantities of blood could be drawn from the livers of living animals with a trocar—autopsy a few days later showing that no blood had apparently escaped from the liver wound and even the wound in the capsule in many cases being detectable only as a small circular ecchymosed spot, without so much as an inflamed area surrounding it—Harley¹ conceived of the operation of hepatic phlebotomy in cases of severe hepatitis. Any risk of air entering a vein during the operation is avoided by inserting the trocar into the upper and convex part of the liver where no large veins

¹Remarks on hepatic phlebotomy. By George Harley. *Brit. Med. Jour.* vol. ii, 1886, page 899.

whatever exist; and even should there chance to be, on account of some abnormality in the distribution of the vessels, one or two in this portion of the organ, it is a most unlikely thing that a canula of the size of between a No. 2 and a No. 3 English catheter would encounter one of sufficient calibre to admit of the accidental lodgment of the free extremity of the trocar within the vessel so as to permit the entrance into it of air. Even with the enlargement of the vessels of an engorged liver, it is difficult to imagine a large enough vein to admit a 2 or 3 English catheter, in the upper and convex portion of the liver, seeing that no large hepatic vessels, either veins or arteries, are normally to be encountered except in the neighborhood of the portal fissure. It should also be remembered that the entrance of air is a source of danger only in the case of the hepatic vein, for it alone could by any possibility allow sufficient air to cause death to arrive at the heart in an undivided state. The necessity of its traversing the minute capillaries of the liver, where it would become so diffused as to be rendered harmless before reaching the heart, would permit the entrance of air into the arterial or portal venous circulation with comparative impunity.

The operation was tested in the case of a woman of intemperate habits, *æt.* 38, who had been attacked a month before with hepatitis; the lower part of the body was anasarcaous and the abdomen filled with fluid, which had rapidly reappeared after tapping. Other treatment having been unavailing, as a forlorn hope, hepatic phlebotomy was performed. The patient being anesthetized, a trocar between a No. 2 and 3 English catheter in diameter and 8 inches long, was thrust up to its hilt in the upper part of the liver, from right to left; this was done in the hope that during its transverse penetration of the organ, it might wound one or more vessels—arteries or veins, it did not matter which—of sufficient calibre to yield a free stream of blood. On withdrawing the canula an inch or two, so as to permit the blood oozing from the wounded vessels, to enter the canula from the canal left in the liver tissue by the receding instrument, a full stream of blood immediately issued from its free orifice. Twenty ounces of hepatic blood was abstracted in this way with the result that from that

very day the liver became reduced in size and, with appropriate treatment for the ascites and general anasarca, a cure was rapidly obtained. After the canula were withdrawn a 2-inch square piece of sticking plaster was applied over the abdominal puncture and the abdomen tightly bandaged to bring the abdominal wall into close contact with the wound in the capsule of Glisson, so as to avoid all possibility of hæmorrhage into the peritoneal cavity, in case the natural resilience of the hepatic tissue should not suffice to close the opening—a thing very unlikely to occur unless the operation was bunglingly performed and some large vessel wounded because the trocar had not been properly inserted.

PUNCTURE OF GLISSON'S CAPSULE FOR CHRONIC CONGESTIVE HYPERTROPHY OF THE LIVER.—The facts that simple puncture of the liver for the diagnosis of hepatic abscess, even where no pus is found, often renders the patient more comfortable, that the liver tissues are confined by a strong, inelastic fibrous capsule by which the recently inflamed and still congested tissues are compressed in cases of chronic congestive hypertrophy, and that immediate relief often follows puncture of other equally unyielding fibrous coverings when their contents are in a state of acute or subacute inflammation, as in orchitis, acute sciatica or paronychia, suggested to Harley¹ the propriety of puncturing the capsule of Glisson in these cases.

This practice has met with marked success. With ordinary trocars, varying in size from a No. 2 to a No. 6 English catheter, he makes, according to the strength of the patient and the gravity of the symptoms, from three to six punctures in the right or left lobe of the liver, according to which is the most gravely affected; he withdraws the trocars, leaving the canula in place for a minute or two, to admit of the oozing away of any liquid that may chance to be present at the seat of puncture. No anæsthetic is necessary nor any other precaution beyond employing clean instruments lubricated with carbolized oil. When the operation is completed he covers the seat of each puncture with a separate piece of diachylon plaster, two inches square,

¹Puncturing the liver's capsule as a remedial measure in cases of chronic congestive hypertrophy. By George Harley. *Brit. Med. Jour.* vol. ii., 1886, p. 900,

and secures them from being rubbed off and, as well, keeps the abdominal wall close against the liver by putting a few turns of bandage about the abdomen, and instructs the patient to remain in bed for twelve hours and to abstain from stimulants for twenty-four hours. Dr. Harley accompanies his description of this procedure by a report of two exceedingly severe and unfavorable cases, in one of which marked amelioration followed and in the other a cure was obtained by its application.

GALL STONES IN THE LIVER.—A case reported by Thornton¹ is worthy of preservation because of its exceptional character and the operation by which it was relieved. The patient was a delicate woman of 57, bearing in the situation of the gall-bladder, a swelling as large as a good sized pear, very tender and very mobile; at its lower border some hard square bodies could be felt, which, with a history of gall-stone colic extending over many years, rendered the diagnosis free from difficulty and, as the patient's health was failing, operation was advised. An incision over the tumour, however, showed that it was not the gall-bladder but liver tissue, through which the stones could easily be felt moving on one another; behind the mass could be found a small atrophied gall-bladder and in the common duct a large stone. The swelling having been packed around with carbolized sponges, and aspiration having produced only a few drops of bloody serum, an incision about an inch long into the most prominent part of the tumor through about a half an inch in depth of liver-tissue came upon a very tightly packed mass of gall-stones. The hæmorrhage was very free but soon ceased with sponge pressure. The upper layer of stones was very small, and as these were cleared away, stones with facets were found; it was necessary to use various instruments to remove them—directors, lithotomy scoops and different forceps—until at last the cavity was clear; then the operator, passing his in, found the large stone which he had felt in the common duct, firmly wedged, and had to break it up with lion forceps and remove it in pieces; there was a long chain of single, bigger stones leading down to this impacted one; the bile must have constantly filtered past this

¹ *Loc. cit.*

stone, as the patient never had any jaundice and, while the stones in the cavity were almost like mother of pearl, the large one and those immediately above it were deeply bile-stained. There were in all 412 stones. The edges of the liver wound were sutured to those of the parietes, the cavity sponged out, and drainage provided, with rapid and complete recovery. The pathology of the case is puzzling; it is possible that the stones originally formed in the gall-bladder and that, its posterior surface becoming thinned and atrophied by pressure, they gradually made their way into the substance of the liver, destroying the wall of the gall-bladder at the point of exit; there was, however, nothing in the history of the case to mark a severe lesion of this kind, and the gall-bladder, although atrophic and empty, appeared to be perfect. It is more probable that the large stone originally formed in the gall-bladder and then became impacted in the common duct so as abrogate the function of the gall-bladder, and that the other stones were formed in the hepatic duct and above it in the substance of the liver, where they gradually hollowed out the cavity from which they were removed—and this is the opinion of the operator.

CHOLECYSTOTOMY.—Incision of the gall-bladder is so firmly established as a surgical procedure as to need no argument in its support. The papers of Bernays, Boeckel, Fuhr, Keen, Landerer, Lange, Parkes, Robson, Tait, Thiriar and Wesener, contributing to this end, have been presented in abstract in the *ANNALS OF SURGERY* as they have appeared. The papers presented at the meeting of the British Medical Association, to which reference has already been made, confirm fully the propriety of the operation. Lawson Tait¹ presented twenty-nine consecutive cases, of which twenty-eight were successful, demonstrating conclusively that the operation, when properly performed, is as devoid of risk as any surgical procedure possibly can be, having in this respect an advantage over all other procedures for the treatment of gall-stones, because in none of them has anything but a heavy mortality been obtained. Tait considered that diagnosis is also, in his hands at least, approaching a greater degree of certainty, for, in but

¹The surgical treatment of diseases of the liver. By Lawson Tait. *Brit. Med. Jour.*, vol. ii., p. 9-6.

three cases had he made a mistake in diagnosis, distention of the gall-bladder existing in two of the cases, due in one of them to a bit of cancer obstructing the common duct, while the third was a case of cholæmia in which no stone was found, but the operation cured the patient. Mr. Tait's method of operating has already been described in this journal (vol. iii, p. 397).

As a result of the examination of his cases of gall stones, he concludes that persistent intense jaundice is not only not a symptom of gall-stones, but is a symptom which might make us hesitate to advise operation even in cases where we feel pretty sure that the gall-stones enter into the case; for it was observed that those cases in which cancer of the liver occurred as a complication, jaundice was a constant symptom.

He believes that the definition of the success of all abdominal operations should be divided into primary and secondary, the former referring to the operation alone while the latter refers to the effect upon the trouble for which is performed.

Thornton¹ refers to a case in which, after diagnosis of gall-stones, the abdomen was opened and about the gall-bladder many dense adhesions, but no calculi in the gall-bladder were found. There was a strong band across the end of the gall-bladder, and the question arose whether it might not be the cause of the colic by preventing proper contraction, and whether it should be divided. The risk of doing more harm than good with structures of this kind deep in the cavity and to be dealt with only by touch determined the surgeon to leave it alone; he however freely divided the suspensory ligament and separated the adherent omentum from the ligament, liver and parietes. The patient made an excellent recovery and had no return of the colic.

ARTIFICIAL BILIARY FISTULA.—Willett² reports a case of obstruction of bile for which exploratory incision was performed and complete occlusion of the common bile-duct, probably due to chronic inflammatory changes leading to a gradual but complete stenosis, being found, an

¹*Loc cit.*

²Complete obstruction of the common bile-duct; cholecystotomy; biliary fistula marked improvement. By Alfred Willett. *Brit. Med. Jour.*, vol. ii, 1886, p. 903.

external fistula was made. The patient's sufferings were completely relieved, her jaundice very markedly diminished and her health greatly improved as she remained in the hospital, but she died not many months after, it was said, exhausted by sores produced from the discharge.

If obliteration of the duct could have been foretold, aspiration of the gall-bladder and an occasional repetition of it would probably have given the same relief to the patient as the operation, without the association of a continual irritating discharge. And he considers it a point for discussion as to whether cutting into and draining the gall-bladder should be undertaken before aspiration has been fairly tried, having also in view the additional information which the point of the needle might acquire, when the obstruction is due to gall-stones.

In cases similar to this, it would be advisable, says Mr. Willett, to render the cholecystotomy a complete operation, forming an artificial channel between the gall-bladder and the intestine, at a point where they lie in close proximity, in order that the biliary secretion should be discharged, after the normal arrangement, into the bowel rather than drain away externally. One of two points must be chosen: (1) at or about the junction of the first and second part of the duodenum, and (2) where the ascending colon curves and becomes transverse, these being the points where naturally produced entero-biliary fistulæ are almost invariably found to have occurred. The selection of the former would be based on physiological reasons and that of the latter upon mechanical reasons, because of its close relations to the gall-bladder here. The writer would unhesitatingly choose the latter, chiefly for two reasons: (*a*) the operation of forming a communication between the gall-bladder and the duodenum would be much more difficult in all cases, perhaps impracticable in some on account of the restricted space at command, the depth at which this part of the duodenum lies and the nature of the structures—referring to the liver in particular—which cover or surround it, while the gall-bladder and colon lie side by side almost in the line of the incision; (*b*) the presumed physiological claims are much less valid than appear at first sight, for microscopic examination of the liver in cases of long standing obstruction shows an

advanced atrophy of the bile-secreting cells; moreover the fluid found in the dropsical gall-bladder is some evidence of this change, being of very low grade, scarcely more than limpid mucus. There is no proof of a possible argument that, were the flow of bile into the intestine re-established, functional activity would again take place in the liver cells. An objection may be raised against establishing direct communication between the gall-bladder and colon, that the fæces now contain putrefactive germs which would probably find their way into the gall-bladder and along the hepatic duct, and excite sup-puration in the liver; that this is not necessarily so is shown by a case recorded in the Transactions of the London Pathological Society where, in a woman who died of uterine cancer and in whom during life no suspicion existed of there being anything wrong with the biliary organs, there was found a large patulous aperture between the colon and gall-bladder, completely shrunken, this last circumstance proving its long duration. In making the communication, the artificial aper-ture should be of a slit-like nature rather than a patulous hole, and the incision in the gall-bladder should be made at its lower rather than its upper part, in the expectation that, with the shrinking of this viscus, a tube-like track would be formed with a valvular termination.

MENTAL EFFECT OF LAPAROTOMY IN CURING DISEASE.—Tait¹ has observed in connection with hepatic troubles a fact noted by Thomas in connection with diagnostical laparotomy—improvement resulting from a simple opening of the peritoneal cavity without other operative action. He records two cases, in one of which he found the liver covered with small seed-like bodies, which he regarded as miliary abscesses; this case recovered the best of health immediately after the operation. The second was a case where the chief symptom was intense hepatic pain; laparotomy revealed only some adhesions between the edge of the liver and the parietal peritoneum; these were separated and the abdomen closed, resulting in relief to the symptoms, which, however, returned later.

JAMES E. PILCHP

¹*Loc cit.* Page 105.